MONTHLY WEATHER REVIEW.

WASHINGTON, D. C., NOVEMBER, 1882.

INTRODUCTION.

This REVIEW presents a general summary of the meteorological data collected by the Signal Service for the month of November, 1882.

An interesting feature in the meteorology of the month has been the magnetic storm that occurred in connection with the brilliant and widely observed auroral display of the 17th. Reports show that the auroral display was also observed throughout Europe, and that the attendant magnetic disturbance was perceptibly felt in that continent.

As a noteworthy feature of the month, may also be mentioned, the marked deficiency in the rainfall over the north Pacific coast region, and over New England and the middle Atlantic states.

That part of the REVIEW referring to International Meteorology, presents the general weather conditions which prevailed over the northern hemisphere during the month of September, 1880. The weather, during the month, differed but slightly from the normal, except in the amount of the rainfall, which was above the average in central Europe. Chart v. exhibits the path of barometric minima for December, 1880. A special feature of that chart is the unusually large number of depressions that appeared on the Pacific coast.

In the preparation of this REVIEW, the following data received up to December 20th, have been used; viz.: the regular tri-daily weather charts, containing the data of simultaneous observations taken at one hundred and thirty-six Signal Service stations and fourteen Canadian stations, as telegraphed to this office; one hundred and ninety-two monthly journals, and one hundred and seventy-nine monthly means from the former, and fourteen monthly means from the latter; two hundred and seventeen monthly registers from voluntary observers; fifty-five monthly registers from United States Army Post Surgeons; Marine Records; International Simultaneous Observations; Marine Reports, through the co-operation of the "New York Herald Weather Service;" abstracts of Ships' Logs, furnished by the publishers of "The New York Maritime Register;" monthly reports from the local weather services of Indiana, Iowa, Kansas, Nebraska, and Missouri, and of the Central Pacific railway company; trustworthy newspaper extracts; and special reports.

BAROMETRIC PRESSURE.

[*Expressed in inches and hundredths.*]

The mean barometric pressure for the month of November, 1882, over the United States and Canada, is shown by the isobarometric lines (in black) on chart ii.

The region of highest mean pressure embraces parts of Utah, Colorado, and New Mexico, and is inclosed by the isobar of 30.30. The highest monthly barometric means, 30.44 and 30.33, have been reported from Pike's Peak, Colorado, and Salt Lake City, Utah, respectively. A large area extending from Washington Territory to northwestern Texas, is inclosed by the isobar of 30.25. From this region eastward, the mean pressures diminish gradually, and are lowest in New England and the Canadian maritime provinces; the lowest monthly mean, 29.95, is reported from Sydney, Nova Scotia. The isobar of 30.15 extends through the lake region to the Atlantic, and thence along the Atlantic and Gulf coasts to the west Gulf states. Westward and southwestward of the region of highest pressure, the monthly means decrease rapidly, and are lowest in southern Arizona, where the lowest means reported are 30.04, at Yuma, and 30.06 at Tucson.

Compared with the means of the previous month, the pressure is higher in all districts, except in New England. The most marked increase occurs in the Rocky mountain regions, where the pressure is from 0.20 to 0.40 higher. On the Pacific coast, the increase ranges from 0.04 to 0.21. From the Mississippi river eastward to the middle and south Atlantic states, the increase varies from 0.05 to 0.22. In New England, the pressure is from 0.01 to 0.05 lower, except at Boston, Massachusetts, where there is no change.

DEPARTURES FROM THE NORMAL VALUES FOR THE MONTH.

Compared with the November means of previous years, the pressure is from 0.02 to 0.07 below the normal from New England southwestward to the Mississippi river. In the lake region and from the Mississippi westward to the Rocky mountains, the pressure is from normal to 0.11 above. On the Pacific coast, the departures vary from normal to 0.06 below.

BAROMETRIC RANGES.

Throughout the country the barometric ranges have varied from 0.45 at Fort Grant and Tucson, Arizona, and 0.49 at San Diego, California, to 1.07 at Eastport, Maine, 1.10 at Alpena, Michigan, and 1.20 at Pike's Peak, Colorado. In the several districts the ranges have been as follows:

New England: From 0.83 at Provincetown, Massachusetts, to 1.07 at Eastport, Maine.

Middle Atlantic states: From 0.67 at Norfolk, Virginia, to 0.96 at Albany, New York.

South Atlantic states: From 0.60 at Charlotte, North Carolina, and 0.61 at Augusta, Georgia, to 0.87 at Hatteras, North Carolina.

Florida peninsula: From 0.68 at Key West, to 0.76 at Cedar Keys.

East Gulf states: From 0.79 at Starkville, Mississippi, and Montgomery, Alabama, to 0.94 at New Orleans, Louisiana.

West Gulf states: From 0.64 at Fredericksburg, Texas, to 0.85 at Galveston, Texas, and 0.88 at Port Eads, Louisiana.

Rio Grande valley: From 0.74 at Brownsville, Texas, to 0.75 at Eagle Pass, Texas.

Ohio valley and Tennessee: From 0.53 at Louisville, Kentucky, to 0.74 at Pittsburg, Pennsylvania, and 0.77 at Memphis, Tennessee.

Lower lake region: From 0.73 at Cleveland, Ohio, to 0.90 at Oswego, New York.

Upper lake region: From 0.90 at Chicago, Illinois, and Port Huron, Michigan, to 1.02 at Escanaba, Michigan, and 1.10 at Alpena, Michigan.

Extreme northwest: From 0.75 at Fort Stevenson, Dakota, to 0.96 at Fort Buford, Dakota.

Upper Mississippi valley: From 0.58 at Cairo, Illinois, and 0.66 at Saint Louis, Missouri, to 1.03 at La Crosse, Wisconsin.

Missouri valley: From 0.64 at Springfield, Missouri, to 0.90 at Huron, Dakota.

Northern slope: From 0.54 at Fort Custer, Montana, to 0.76 at North Platte, Nebraska.

Middle slope: From 0.68 at Fort Elliott, Texas, and 0.71 at Denver, Colorado, to 1.20 on the summit of Pike's Peak, Colorado.

Southern slope: From 0.52 at Fort McKavett, Texas, to 0.75 at Fort Sill, Indian Territory.

Southern plateau: From 0.45 at Fort Grant and Tucson, Arizona, to 0.68 at Santa Fé, New Mexico.

Middle plateau: From 0.69 at Winnemucca, Nevada, to 0.84 at Salt Lake City, Utah.

Northern plateau: From 0.64 at Fort Missoula, Montana, to 0.85 at Boisé City, Idaho, and 0.86 at Umatilla, Oregon.

North Pacific coast region: From 0.77 at Roseburg, Oregon, to 0.91 at Olympia, Washington Territory.

Middle Pacific coast region: From 0.60 at San Francisco, California, to 0.62 at Cape Mendocino, California.

South Pacific coast region: From 0.49 at San Diego, California, to 0.57 at Visalia, California, and 0.67 at Yuma, Arizona.

AREAS OF HIGH BAROMETER.

Six areas of high barometer have been sufficiently defined to merit description. These have all first appeared on the northern boundary of the United States, from Lake Superior to the Pacific coast. Of these, three, i., iii., and v., had an easterly path; ii. and vi., which were associated with cold waves, producing great temperature changes, had a southerly path.

I.—On the 1st, there extended over the northwest and upper lake region, an area of high-pressure central in Manitoba. The highest pressures reported were, Fort Garry, Manitoba, 30.66, Saint Vincent, Minnesota, 30.64, Huron, Dakota, and Moorhead, Minnesota, 30.63, Duluth, Minnesota, 30.61; all more than 0.5 inches above the mean. On the 2d, the high barometer was central north of the upper lake region; the highest pressure reported, observed at 3 p. m., was 30.7, at Marquette, Michigan, or 0.69 inches above the normal. On the 3d, the high area moved rapidly to the eastward, and at the end of the day was central over New England. On the 4th, the barometer rose slightly in New England, and in the maritime provinces of Canada. On the 5th, 6th, and 7th, with slight fluctuations, averaging nearly one-half inch above the mean; the high area remained over Maine and the maritime provinces. During the existence of this high-pressure, fair weather prevailed in the northwest and upper lake region, on the 1st, 2d, and 3d; in the Ohio valley, on the 2d, 3d, and 4th; in the lower lake region, on the 2d, 3d, 4th, and 5th; in the middle states, on the 3d, 4th, 5th, and 6th; in New England, on the 2d, 3d, 4th, 5th, and 6th. In connection with this high-pressure, with the barometer high in New England, and low in the Gulf of Mexico, the temperature fell below the mean for the month in the south Atlantic states, during the prevalence of the northeasterly winds. On the 2d, cautionary signals were displayed on the North Carolina and Virginia coasts, which were justified by the following velocities: Hatteras, 42 ne.; Kittyhawk, 43 ne.; Cape Henry, 34 n.; Chincoteague, 33 ne.; on the 4th, cautionary signals were displayed from Macon, North Carolina, to Sandy Hook, New Jersey, and were justified by the following maximum velocities: Macon, 38 ne.; Hatteras, 44 ne.; Kittyhawk, 50 ne.; Cape Henry, 40 n.; Chincoteague, 32 n.; Delaware Breakwater, 43 ne.; Cape May, 27 n.; Atlantic City, 30 ne.; Barnegat, 38 ne.; Sandy Hook, 32 ne.

II.—On the 10th, there was a sharp rise in pressure in Idaho, Montana, and Dakota, in the rear of low area ii. On the 11th, the high area pressed to the southward. On the 12th, the rising barometer advanced to the Indian Territory and northern Texas. On the 13th, the high area extended over the Gulf states. On the 12th and 13th, while the pressure was rising east of the Rocky mountains, the centre of the high area, averaging 0.3 inch above the mean, was in Utah. For six of the tri-daily observations, the barometer at Salt Lake City was above 30.6 inches. This high pressure was, as is usual, associated with a cold wave. Many observed temperatures were 30° below the normal for the month. As the cold wave pressed southward, changes in temperature exceeding 40° for twenty-four hours were frequently reported. On the 10th, the region south of the Platte river was warned by telegraph of the approach of a "norther." For the protection of the sugar interests, frost warnings were also sent to New Orleans. In connection with this high pressure, the minimum temperatures for the month were generally reported from the Rocky mountain region. The following special temperatures were noted: Fort Washakie, Wyoming, —23°; Cheyenne, —15°.5; Pike's Peak, —26°. Cautionary signals displayed at Indianola and Galveston were justified by the following maximum velocities: Indianola, 52 n.; Galveston, 48 n.

III.—On the 15th, there was a very sharp rise of pressure in Idaho and Montana, which extended on the 16th into the Missouri valley. At the last observation of that day the isobar of 30.5 included the greater part of Minnesota, Dakota, Nebraska, and Kansas. On the 17th, the centre of high barometer was rapidly transferred to the Saint Lawrence valley, disappearing on the 18th beyond the coast. On the 17th, in connection with this high pressure, cautionary signals were ordered from Sandy Hook to Delaware Breakwater. On the 18th, from Chincoteague to Hatteras, and they were justified by the following velocities: Sandy Hook, 31 ne.; Barnegat, 30 ne.; Chincoteague, 30 nw.; Kittyhawk, 36 ne.; Hatteras, 38 ne.

IV.—While the high area described as iii. was moved to the eastward, the barometer continued above the mean in the northern part of the United States, west of the Missouri river. On the 16th, the highest pressures were reported from Washington Territory; on the 17th, from Idaho and Montana; on the 18th, from Nebraska and Kansas; on the 19th, the high pressure only slightly above the mean, was carried to the upper lake region.

V.—On the 22d, the barometer rose rapidly in the Missouri valley in rear of depression iv. On the 23d, the high area moved in a southeasterly track, and become central in Kansas. On the 24th, the region of highest pressure—the Ohio valley and Tennessee—was enclosed in the isobar of 30.4. On the 25th, the high pressure was in the middle states, and, on the 26th, disappeared beyond the limits of the chart in advance of a slight depression, not charted, then central in the lower lake region.

VI.—On the 26th, there was a very marked rise of the mercury in Washington and Idaho Territories. On the 27th, the high barometer extended from Idaho and Montana to Texas and the Indian Territory, being highest in Utah, where the pressure exceeded 30.5 inches. On the 28th, the isobar of 30.5 included Manitoba, Dakota, and Nebraska. On the 29th, the highest pressure was rapidly transferred to Texas, and on the 30th, the center of high barometer was in the Gulf states. The following are the maximum pressures in inches reported in connection with this high area: Indianola 30.66; Galveston, Eagle Pass, Palestine, and New Orleans 30.63. Associated with

this high-pressure were many of the minimum temperatures of the month in the west Gulf states and the region east of the Mississippi river. The temperature fell below freezing at Atlanta, Georgia; Montgomery and Mobile, Alabama; Pensacola, Florida; Vicksburg, Mississippi; and Shreveport, Louisiana.

AREAS OF LOW BAROMETER.

Five areas of low barometer have been sufficiently well defined to justify their charting, and the centres of depression have been located at each telegraphic report, from the first appearance of the low area until its dissipation, or disappearance beyond the stations of observation. The storm-tracks for the month of November, 1882, will be found on chart I. Two of the depressions, i. and ii., first appeared on the Pacific coast, moved in an easterly course over the Rocky mountains to the upper lake region, where i. was dissipated, and ii., turning to the northeast, moved beyond the limits of the observing stations.

Two areas of low barometer, iii. and v., which, in their course, developed into severe storms, were first observed near the mouth of the Rio Grande; they pursued very nearly the same track over the Gulf states, and then very nearly the same northeasterly path along the Atlantic coast.

The following table gives the number of areas of low-pressure noted in the November Weather Reviews since 1873, and the average hourly velocity of the low centres, in miles per hour:

Year.	No.	Hourly velocity.	Year.	No.	Hourly velocity.
1873	12	—	1878	14	21.2
1874	10	—	1879	18	40.7
1875	14	—	1880	16	34.1
1876	15	22.6	1881	16	30.8
1877	12	25.5	1882	5	27.7

The following table gives the latitude and longitude in which each area was first and last observed, and the average hourly velocity:

Areas of low barometer.	First Observed.		Last Observed.		Average velocity in miles per hour.
	Lat. N.	Long. W.	Lat. N.	Long. W.	
	° ′	° ′	° ′	°	
No. I.	45 00	123 30	43 30	87 30	25.6
II.	38 30	122 00	47 30	84 30	32.2
III.	27 30	97 00	45 00	59 30	25.6
IV.	44 30	104 00	47 00	58 00	25.7
V.	26 30	98 30	47 30	58 30	29.5
Mean hourly velocity					27.7

I.—On the 2d, there was a sudden fall in pressure on the coast of Oregon and Washington Territory, accompanied by light rains, which extended the next day southward to San Francisco and eastward to Idaho From the morning of the 3d to the morning of the 4th, the centre of depression passed very rapidly from the Pacific coast to Dakota. On the 4th, the low area remained in Dakota and Minnesota, exhibiting but little energy. On the 5th and 6th, the depression moved slowly to the southeastward, with diminishing force, and on the latter day was, while central over Lake Michigan, filled up by the inflowing air. Cautionary signals were ordered on the 4th, in advance of this storm, for the ports of Lakes Superior and Michigan. The following are the maximum velocities reported: Duluth, 36 ne.; Escanaba, 26 se.; Milwaukee, 30 se.

II.—On the 8th, a depression accompanied by general rains throughout the state, entered California near San Francisco. On the 9th, the centre of low area, moving in an easterly track, crossed the Rocky mountains. On the 10th, the depression, slowly increasing in energy, moved into Iowa; on the 11th, the storm-centre moved in a northeasterly path to the upper lake region, and, on the 12th, disappeared beyond the limits of the chart. This depression was followed by the high-pressure described as ii, and which was accompanied by the cold wave which produced the greatest temperature change of the month in the south. Cautionary signals were ordered to be displayed in advance of this storm on the 10th and 11th instants for all the lakes. The following are the maximum velocities reported: Duluth, 44 ne.; Marquette, 25 e.; Milwaukee, 33 sw.; Grand Haven, 33 s.; Mackinac City, 27 sw.; Alpena, 31 se.; Port Huron, 26 w.; Detroit, 27 s.; Toledo, 27 sw.; Sandusky, 37 nw.; Erie, 28 nw.; Buffalo, 28 sw.; Rochester, 31 w.; Oswego, 28 w. Cautionary signals were ordered for exposed ports on the New England coast on the 11th. The following are the maximum velocities reported: Eastport, 35 ne.; Thatcher's Island, 30 s.; Provincetown, 25 s.; Block Island, 39 sw.

III.—On the 18th, there was a fall in pressure near the mouth of the Rio Grande, it was accompanied by general rains and northeasterly winds in Texas. On the 19th, the storm-centre moved with considerable energy in a northeasterly track. On the 20th, it moved over the southern parts of Alabama and Georgia, and, at the midnight observation, the centre of low area was southeast of Savannah, Georgia. On the 21st, the storm-centre, increasing in energy, changed its path to the southeast, with high northeast, backing to northwest winds, on the South and North Carolina coasts. Reports from Nova Scotia and marine observations show the path of the storm, as charted, on the 22d and 23d. In connection with this storm-centre on the 18th, cautionary signals were ordered at Indianola, Galveston, and Port Eads; on the 19th, from New Orleans to Cape Henry. The following are the maximum velocities reported: Indianola, 35 n.; Galveston, 40 nw.; Port Eads, 44 nw.; New Orleans, 25 se.; Cedar Keys, 28 e.; Savannah, 28 ne.; Charleston, 26 ne.; Smithville, 32 ne.; Macon, 34 ne.; Hatteras, 40 ne.; and Kittyhawk, 38 ne.

IV.—On the 21st, a depression was developed in Wyoming and Dakota, but without any display of storm energy. On the 22d, with a considerable increase in storm intensity, the centre of low area moved into Iowa. The depression was accompanied in its south and east quadrants by fair weather, and in its north and west quadrants, by general snows. On the 23d, as it moved in a northeasterly track over the upper lake region, the storm-centre received a sudden and great increase of energy. On the 24th and 25th, the depression moved, as charted, over the Saint Lawrence valley and the Maritime Provinces beyond the coast. It was remarkable, for a storm of such energy, that the precipitation should have been confined so near to the centre of low area. Cautionary signals were ordered in advance of this storm on the 22d, for Lake Michigan, and on the 23d, for Lakes Huron and Ontario. Cautionary northwest signals were ordered for Lake Erie on the 23d. The following are the maximum wind-velocities reported: Milwaukee, 36 w.; Grand Haven, 52 nw.; Mackinac City, 28 nw.; Toledo, 38 sw.; Sandusky, 42 nw.; Cleveland, 31 w.; Erie, 45 nw.; Buffalo, 56 w.; Rochester, 36 w.; Oswego, 27 nw. Cautionary signals were ordered on the 23d, from Chincoteague to Hatteras, and cautionary or cautionary off-shore signals, on the 24th, on the Atlantic coast from Eastport to Delaware Breakwater. The following are the maximum wind-velocities reported: Eastport, 35 se., and 30 nw.; Portland, 25 nw.; Thatcher's Island, 44 w.; Boston, 30 nw.; Provincetown, 32 nw.; Newport, 34 w.; Block Island, 40 nw.; New York, 25 w.; Sandy Hook, 35 w.; Barnegat, 39 w.; Cape May, 55 w.; Delaware Breakwater, 40 nw.; Chincoteague, 54 nw.; Cape Henry, 45 nw.; Hatteras, 25, n.

V.—On the 25th, the pressure fell in southwestern Texas, and, at the morning observation of the 26th, a depression was developed near the mouth of the Rio Grande; during the day it moved slowly to the eastward and south of Indianola and Galveston. On the 27th, pursuing the same direction, the storm area entered the east Gulf states. At the morning report of the 28th, the storm-centre was near Savannah. The depression then developed a great increase of energy, and turned to the northeast, moving nearly parallel to the south Atlantic coast. At the midnight observation the lowest pressures reported were: Hatteras, 29.54; Kittyhawk, 29.59, or 0.67 and

0.64 inches below the normal respectively. On the 29th, the centre of low area moved nearly parallel to the north Atlantic coast, where high northeasterly gales, with snow, prevailed. The storm was evidently very heavy at sea. Cautionary signals displayed on the Texas coast were justified by the following velocities: Indianola, 32 nw.; Galveston, 36 n. Cautionary signals were displayed in advance of this storm on the Atlantic coast on the 27th, from Jacksonville to Kittyhawk; on the 28th from Cape Henry to Provincetown; on the 29th from Boston to Eastport. The following are the maximum velocities reported: Savannah, 25 ne.; Charleston, 28 ne.; Smithville, 31 ne.; Macon, 48 n.; Hatteras, 38 nw.; Kittyhawk, 45 ne.; Cape Henry, 56 nw.; Chincoteague, 40 ne.; Delaware Breakwater, 45 ne.; Cape May, 40 nw.; Atlantic City, 30 ne.; Barnegat, 37 ne.; Sandy Hook, 39 ne.; Block Island, 26 ne.; Newport, 25 n.; Provincetown, 28 ne.; Eastport, 37 ne.

NORTH ATLANTIC STORMS DURING NOVEMBER, 1882.

On chart SUPPLEMENTAL TO i. will be found the tracks of the principal storms that have prevailed over the north Atlantic ocean during November, 1882. The tracings of the paths of the centres of barometric minima are based on reports of observations received from agents and captains of ocean steamships and sailing vessels in the north Atlantic during the month, and from other miscellaneous data on file at this office up to December 25th.

The observations used are, in general, simultaneous, being taken each day at 7h. 0m., a. m., Washington, or 12h. 8m., p. m., Greenwich mean time.

The following brief notes concern the storms above mentioned:

I.—On the 1st, an area of low-pressure occupied the ocean between N. 45° and 55°, and between W. 25° and 35°. The lowest reported pressure was observed in N. 50° 08′, W. 27° 13′; the s. s. "Scythia", reporting barometer 29.19 (741.4 mm.), wind w., force 7; rough sea and showery weather. By the morning of the 2d, the region of lowest pressure had apparently moved towards the British coasts; on that date, the s. s. "Celtic", in N. 51° 31′, W. 13° 52′, reported barometer 29.25 (742.9 mm.), wind w., force 8; squally and showery weather, with heavy sea. The barometer remained low near the British coasts, and strong westerly and southwesterly winds prevailed until the 4th.

II.—On the 2d, an area of low-pressure, probably subsidiary to low area i., appeared over mid-ocean, causing strong westerly gales and showery weather. On the 3d, the region of lowest pressure was near N. 54°, W. 28°. The s. s. "Anchoria," in N. 52° 58′, W. 28° 10′, reported barometer 29.30 (744.2 mm.), wind wsw., force 9; squally weather and heavy sea.

III.—On the 7th, a deep depression appeared near N. 55°, W. 20°. It apparently moved eastward, causing a decrease in pressure over that part of the ocean east of the fifteenth meridian. The s. s. "Bolivia," in N. 55° 02′, W. 19° 27′, reported barometer 28.85 (732.8 mm.), wind nw. force 8; rainy. On the 8th, the depression was probably near the northwestern coast of Ireland; the s. s. "Arizona," in N. 51° 27′ .W 14° 05′, reported barometer 29.32 (744.7 mm.), wind wsw. force 7; squally weather and lightning, and the s. s. "Stella," in N. 50° 59′, W. 14° 19,′ barometer 29.21 (741.9 mm.), wind wsw. force 9; squally.

IV.—A well-defined depression appeared on the 10th, with its centre to the westward of the Azores. The s. s. "Madrid," in N. 38° 54′, W. 25° 31′, reported barometer, 29.70 (754.4 mm), being a fall of .38 inch in twenty-four hours; wind s. to sw. force 6; very heavy rain. On the 11th, the disturbance moved eastward and was probably central northeast of the Azores; the s. s. "Madrid" reported as follows: 11th, in N. 39° 19′, W. 27° 16′, at 7 a. m. wind w. force 7, lasted till 4 p. m., lowest barometer reading 29.62 (752.1 mm.). At 6 p. m. the wind shifted to wnw. and nw. and gradually decreased in force, while the barometer began to rise. At the same day, the s. s. "Peconic," in N. 36° 35′, W. 18° 00′, had s. wind of force 7; barometer falling and weather threatening. On the 12th, the same vessel, in N. 36° 50′ W. 22° 00′, reported barometer 29.74 (755.4), wind w. force 6; long cross sea.

V.—The reports indicate that a disturbance was present on the 13th near N. 50°, and between W. 30° and 40°. The s. s. "Stella," in N. 50° 36′, W. 32° 40′, reported barometer 29.62 (752.3 mm.), wind nw., force 5, squally. On the 14th, the s. s. "Wyoming," in N. 51° 22′, W. 25° 11′, had moderate winds, increasing to strong w. and sw. gale, with head sea. On the 15th, the depression moved northeastward, and was central near N. 55°, W. 14°; on that date, the s. s. "Scandinavian," in N. 54° 40′, W. 16° 12′, reported: 1.17 a. m. (Greenwich mean time), wind shifted to nw., with showery weather; at 8.49 a. m., barometer 29.48 (748.8 mm.), oscillating till noon; at 0.50 p. m., wind unsteady in direction and force; squalls moderating, but coming in quick succession, with hail and rain, sea very confused. This storm was probably identical with that which prevailed on the British coasts on the 16th.

VI.—This is a continuation of the storm traced as low area iii. on chart i. for November. On the 23d, the disturbance was central near the entrance to the Gulf of Saint Lawrence. It apparently moved northeastward, and on the 24th, was shown near N. 50°, W. 50°; the s. s. "Polynesian," in N. 48° 39′, W. 47° 41′, reported barometer 29.16 (740.7 mm.), wind sw., force 5, overcast, rough sea. On the 25th, the storm-centre, having moved slowly eastward, was apparently near N. 50°, W. 40°. During the 26th and 27th, the disturbance appears to have moved very slowly and was central in mid-ocean; on the last-mentioned date, the depression disappeared; probably yielding to the influence of an area of high barometer that prevailed on the 27th, 28th, and 29th, over the Atlantic east of the thirtieth meridian.

VII.—This is a continuation of low area iv of chart i. The depression was central in the Gulf of Saint Lawrence on the 26th; it moved over Newfoundland and disappeared to the northeastward on the following day.

INTERNATIONAL METEOROLOGY.

International charts iv. and v. accompany the present number of this REVIEW. Chart iv. is published for September, 1880, and continues the series of that chart began in January, 1877. Chart v. is prepared for November, 1880, and continues the series of that chart began in November, 1877. For the description of these charts, much valuable information has been obtained from the "Monatliche Uebersicht der Witterung," published by Professor Dr. G. Neumayer, Director of the German Marine Observatory at Hamburg, and from the "Bulletin Mensuel," published by Mr. Marc Dechrevens, of Zi-Ka-Wei, China.

Chart iv. exhibits the mean pressure, mean temperature, and the prevailing direction of the wind over the northern hemisphere, and at certain isolated stations in the southern hemisphere, as determined from one observation taken each day at 7.35 a. m. Washington, or 0.43 p. m. Greenwich mean time.

Two areas of barometric minima are shown on the chart. The first area, enclosed by the isobar of 29.70 (754.4), occupies British India; the second area, 29.80 (756.9), covers the extreme northwestern part of Norway, and, extending westward, includes Iceland within its limits.

The isobar of 29.90 (759.4) occupies Norway, Scotland, the northwest of Ireland, and the northern part of British America.

In the United States, the area of highest pressures occupies the south Atlantic and Gulf states, and the southern parts of Tennessee and Virginia.

On the Pacific coast, the area of barometric maxima occupies Oregon and Washington territory, the highest monthly mean, 30.23 (767.8), being reported from Umatilla, Oregon.

Compared with the preceding month, (August, 1880), the mean atmospheric pressure, in the United States, has increased over the country lying between the Atlantic ocean and the ninetieth meridian, and between 30° and 40° north latitude. It has also increased slightly on the Pacific coast. In all other parts of the United States, the mean pressure has remained unchanged. In Canada, the mean pressure has decreased slightly.

In Europe, the pressure has decreased over the British Isles; the Scandinavian peninsula, and over Denmark. In all other